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RECENT LITERATURE.

Amphioxus and the Ancestry of the Vertebrates.[1]—This important monograph will be welcomed by all students of zoology as as a valuable accession to the literature of the theory of descent. More than this, the volume bears internal evidence throughout of painstaking care in bringing together, in an exceedingly readable form, all the essential details of the structure and metamorphosis of amphioxus as worked out by anatomists and embryologists since the time of Pallas, its discoverer. The interesting history of the changes it undergoes during metamorphosis, especially its singular asymmetry, is clearly described and ingenious explanations of the phenomena are suggested.

Most important, perhaps, are the carefully suggested homologies of the organs of *Amphioxus* with those of the embryos of the vertebrates above it in rank, especially those of the Marsipobranchs and Selachians. Though the comparisons with the organisms next below amphioxus, such as the Ascidians, *Balanoglosus, Cephalodiscus, Rhabdopleura* and the Echinoderms, will be found no less interesting. In short, the book may be commended to students already somewhat familiar with zoological facts and principles, as an important one to read. They may thus be brought to appreciate to what an extent the theory of descent is indebted to the patient labors of the zoologists of the last forty years for a secure foundation in observed facts, seen in their proper correlations, according to the comparative method.

The figures are good and there is very little that can be adversely criticised in the book. On page 176 it is stated that the ectoderm is not ciliated in any craniate vertebrate. To this statement exception must be taken in regard to the ectoderm of the sides of the body and especially the tail of young tadpoles just hatched. Born in his experiments, in grafting pieces of young tadpoles upon one another, found that the tail, when cut off and lying on its side, had a power of movement, in the cephalad direction, that could be explained only on the supposition that the ectoderm of the sides was more or less extensively covered with cilia. This observation the writer has confirmed in repeating Born's experiments in just hatched tadpoles of *Rana.* The volume, however, brings together everything essential that has ever been made out in regard to *Amphioxus*, so that zoologists will everywhere feel grateful to Mr. Willey for placing in their hands this very useful summary of its life history. The work contains not a little that is new, and some new figures not hitherto published. A very complete bibliography and index completes the volume. One hundred and thirty-three titles are comprised in the list of papers and works consulted in the preparation of the volume. If the other volumes in course of preparation by the professors in biology of Columbia University are up to the high standard of the present one, that institution is to be congratulated upon the enterprise of those who have initiated the project.—R.

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[1] Volume II of the Columbia University Biological Series, by Arthur Willey, B. Sc. 8vo, pp. 316, 135 figures. New York, MacMillan & Co., 1894.

Correlation Papers of the U. S. Geol. Survey: Archean and Algonkian.[2]—This memoir, written by Prof. C. R. Van Hise, is the seventh of the Correlation Papers series, and is, perhaps, one of the most important of that valuable set. The pre-Cambrian rocks of the United States and Canada, for convenience, are considered under the heads of seven districts, which are severally discussed in as many chapters. Each chapter is prefaced with abstracts of all the articles pertaining to the subject considered, classified by dates, together with summaries of the conclusions which appear to be established. Chapter VIII summarizes the various successions proposed, suggests one, and discusses the principles of pre-Cambrian stratigraphy. The Archean is the basal complex of America. It has everywhere, if large areas are considered, an essential likeness. It consists mainly of granitic, gneissic and schistic rocks, among which are never found beds of indubitable clastics. When different kinds of rocks are associated, their structural relations are intricate, which, together with the crystalline schistose character of the rocks, the broken and distorted mineral constituents, and involuted foldings are evidences that these rocks have passed through repeated powerful dynamic movements.

In regard to Algonkian stratigraphy, the writer accepts the structural and lithological principles enunciated by Irving, Pumpelly and Dale. It remains to be demonstrated, however, to the satisfaction of most geologists that the formation termed Algonkian, is not a part of the Cambrian.

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[2] Bulletin of the Geological Survey, No. 86. Correlation Papers. Archean and Algonkian. By Charles R. Van Hise. Washington, 1892.